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EXAMINER	
KIM, KEVIN	

ART UNIT	PAPER NUMBER
2611	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/797,468	SIMON, MARTIN	
	Examiner	Art Unit	
	Kevin Y. Kim	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 June 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed June 26, 2007 have been fully considered but they are not persuasive.

Applicant amended claim 1 to include a preemphais network to distinguish the claimed invention from the prior art. See the rejection as set forth below establishing obviousness of such a feature in light of a new prior art reference.

Applicant argues that there is no motivation to include low pass filters in the apparatus of Walczak et al. However, Shyue clearly teaches lowpass filters coupled to the outputs of DACs to remove unwanted high frequency components after digital to analog conversion. Because of a similar construction, one can easily expects unwanted high frequency components after digital to analog conversion and, thus the use of lowpass filters to removed those unwanted high frequency components. For this reason, it is believed that the Shyue patent provides a clear and particular motivation contrary to applicant's arguments.

Claim Rejections - 35 USC § 112

2. Claims 1-22 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 1 has been amended to require that the local oscillator signal input receive "the complex-value payload signal at a carrier frequency." However, according to the specification

originally filed, what the modulator receives at a carrier frequency is the output signals from a VCO (5) via a frequency divider (4). These output signals are not payload signal. Thus, it is found that the claimed configuration is not disclosed. It appears that applicant wrongly amended claims such that the quadrature modulator has two inputs that receives the same payload signal. For the purpose of examination, the claim is understood as having the original limitation of "a complex-value signal," which is different from a complex-value payload signal.

Claim Rejections - 35 USC § 103

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claims 1-5,14-17 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Walczak et al (US 5,193,223) in view of Franchville et al (US 6,041,076) and Ichihara (US 6,587,513).

Claim 1.

Walczak et al discloses a signal transmission apparatus (see Fig.5), comprising:

a quadrature modulator (402) having an in-phase and quadrature input for receiving a complex-value payload signal (I and Q), having a local oscillator (406) signal input for receiving a complex-value signal at a carrier frequency (90 MHz), and having a signal output for providing a modulated transmission signal,

a digital signal processing unit (502 in Fig.5 and 601 in Fig.7) coupled to the in-phase and quadrature input for supplying the complex-value payload signal (I and Q); and

a feedback path which couples the signal output to the digital signal processing unit, the feedback path including an analog/digital converter (118) for sampling the modulated transmission signal to produce an envelope of the modulated transmission signal.

The claimed invention first differs from Walczak et al's apparatus in that it requires "undersampling" the modulated transmission signal with respect to the carrier frequency. Franchville et al teaches that undersampling having a sampling rate below the required Nyquist rate reduces processing speed requirements including that of the A/D converter. See Summary of the Invention at cols.3 and 4. Thus, it would have been obvious to one skilled in the art at the time the invention was made to undersample the modulated transmission signal in producing an envelope of the modulated transmission signal in Walczak et al's apparatus for the purpose of reducing processing speed requirements including that of the A/D converter as taught by Franchville et al.

The claimed invention additionally requires a preemphasis network in the digital processing unit to set the phase angle and/or amplitude of the in-phase and quadrature input. Ichihara teaches a predistortion network to set the amplitude of the I and Q signals that are to be provided to the quadrature modulator in order to compensating a distortion. Thus, it would have been obvious to one skilled in the art at the time the invention was made to provide a predistortion network in the digital processing unit of Walczak et al for the purpose of reducing distortion as taught by Ichihara.

Claim 2.

Walczak et al discloses that the quadrature modulator includes first and second Gilbert multipliers (404,408) which respectively receive in-phase and quadrature components of the complex-value payload signal, and the quadrature modulator including an adder (410), the first and second Gilbert multipliers having respective outputs which are coupled to the adder.

Claim 3.

Walczak et al discloses a bandpass filter (109) connected between the signal output and the feedback path.

Claims 4 and 5.

Walczak et al discloses a low pass filter (524) upstream of the ADC. See col. 8, lines 1-4 describing a finite impulse baseband filter.

Claim 14.

Since the digital controller (502) receives a digital signal from the A/C converter, the digital signal is stored in a register and used by the digital controller.

Claim 15.

Walczak et al discloses that the quadrature modulator includes first and second Gilbert multipliers (404,408) which respectively receive in-phase and quadrature components of the complex-value payload signal, and the quadrature modulator including an adder (410), the first and second Gilbert multipliers having respective outputs which are coupled to the adder.

Claim 16.

Walczak et al discloses a bandpass filter (109) connected between the signal output and the feedback path.

Claim 17.

Walczak et al discloses a low pass filter (524) upstream of the ADC. See col. 8, lines 1-4 describing a finite impulse baseband filter.

Claim 22.

Walczak et al discloses a TDMA cellular telephone (see Abstract), which is a mobile radio signal transmission apparatus.

5. Claims 6,7,10 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Walczak et al in view of Franchville et al and Ichihara as applied to claim 1 above, and further in view of Shyue (US 6,359,936).

Claim 6.

Walczak et al in combination with Franchville et al further discloses that the apparatus includes first and second digital/analog converters (504,512) coupled between the digital signal processing unit and the in-phase and quadrature input, the first and second digital/analog converters for respectively supplying in-phase and quadrature components of the complex-value payload signal but fails to show first and second low-pass filters respectively coupling the first and second digital/analog converters to the in-phase and quadrature input.

Shyue describes its own prior art quadrature modulator (see Fig.1) where low pass filters (5A, 5B) are respectively coupled to the DACs (4A,5A) apparently to remove undesired out of

band signals. Thus, it would have been obvious to one skilled in the art at the time the invention was made to couple first and second low-pass filters respectively between the first and second digital/analog converters (504,512) to the in-phase and quadrature input of the modulator (402), as shown in Shyue, in order to remove undesired out of band signals.

Claim 7.

Walczak et al discloses that the quadrature modulator includes first and second Gilbert multipliers (404,408) which respectively receive in-phase and quadrature components of the complex-value payload signal, and the quadrature modulator including an adder (410), the first and second Gilbert multipliers having respective outputs which are coupled to the adder.

Claims 10,13.

Since the digital controller (502) receives a digital signal from the A/C converter, the digital signal is stored in a register and used by the digital controller.

6. Claims 8,9,11,12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Walczak et al, Franchville et al, Ichihara and Shyue as applied to claims 6, 7 above, and further in view of Torre et al (US 6,720,839).

Claims 8 and 11.

Walczak et al, Franchville et al and Shyue in combination further discloses that the amplitude is adjusted as a function of the envelope of the modulated transmission signal. See col. 7, lines 10-34. The claimed invention additionally requires influencing the phase angle of the complex-value payload signal as a function of the envelope of the modulated transmission signal.

Torre et al teaches adjusting the phase relation of the base band signal to the quadrature modulator based on the feedback modulated signal. See 2A and col.2, line 60- col.3, line 8 in particular. Thus, it would have been obvious to correct the phase as well as the amplitude of the I and Q signal input to the quadrature modulator as taught by Torre et al.

Claims 9 and 12.

Since the digital controller (502) receives a digital signal from the A/C converter, the digital signal is stored in a register and used by the digital controller.

7. Claims 18-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Walczak et al in view of Franchville et al and Ichihara as applied to claim 1 above, and further in view of Torre et al (US 6,720,839).

Claim 18.

Walczak et al in combination with Franchville et al further discloses that the amplitude is adjusted as a function of the envelope of the modulated transmission signal. See col. 7, lines 10-34. The claimed invention additionally requires influencing the phase angle of the complex-value payload signal as a function of the envelope of the modulated transmission signal.

Torre et al teaches adjusting the phase relation of the base band signal to the quadrature modulator based on the feedback modulated signal. See 2A and col.2, line 60- col.3, line 8 in particular. Thus, it would have been obvious to correct the phase as well as the amplitude of the I and Q signal input to the quadrature modulator as taught by Torre et al.

Claim 19.

Walczak et al discloses that the quadrature modulator includes first and second Gilbert multipliers (404,408) which respectively receive in-phase and quadrature components of the

complex-value payload signal, and the quadrature modulator including an adder (410), the first and second Gilbert multipliers having respective outputs which are coupled to the adder.

Claim 20.

Walczak et al discloses a bandpass filter (109) connected between the signal output and the feedback path.

Claim 21.

Walczak et al discloses a low pass filter (524) upstream of the ADC. See col. 8, lines 1-4 describing a finite impulse baseband filter.

Conclusion

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Y. Kim whose telephone number is 571-272-3039. The examiner can normally be reached on 8AM --5PM M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shuwang Liu can be reached on 571-272-3036. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

July 2, 2007

AU 2611

KEVIN KIM
PRIMARY PATENT EXAMINER